Introduction to CAD for Gardeners

Beginners' guide to computer-aided design

Reference

- Slides natureworks.org.uk/slides/cad
- These notes natureworks.org.uk/slides/cad/notes.pdf
- Contact Jake Rayson hello@natureworks.org.uk

Outline

1. Why CAD?

- This world needs more wildlife forest gardens & more garden designers to design them!
- CAD stands for Computer Aided Design
- CAD is fast, 2D (plan view), line design software
- Do you even need CAD? Paper plan if only 1 design &/or don't want to learn more software.
- CAD pros:
  - 1:1
  - Fast & accurate (old PCs)
  - Easy to edit
  - Portable
- CAD cons:
  - Technical
  - Ugly

- Steep learning curve
- Reasons to plan
  1. Plant spacing
  2. Position of plants
  3. Calculate quantity of plants
  4. Communicate with others
  5. Document what is where

---

2. Setup QCAD

- QCAD is **free** or **cheap**
  - Free version £0
  - Paid version £41
  - QCAD Book £36
  - QCAD is Open Source
- Download QCAD Trial
- Install QCAD, depends on Operating System
- Set units on first start, I use metres
- Remove all trial plugins **except** these:
  - `libqcaddarkstyle.so`
  - `libqcaddxf.so`
  - `libqcadscripts.so`

Name		Size	Type	Date Modified
designer		4.0 KiB	folder	Today
imageformats		4.0 KiB	folder	Today
printsupport		4.0 KiB	folder	Today
script		4.0 KiB	folder	Today
sqldrivers		4.0 KiB	folder	Today
libqcaddarkstyle.so		51.0 KiB	shared library	Today
libqcaddxf.so		512.5 KiB	shared library	Today
libqcadscripts.so		5.9 MiB	shared library	Today

- Location of plugins folder:

- MacOS: `Applications/QCAD.app/Contents/PlugIns` (Right-click on `QCAD.app` and click `Show Package Contents`)
- Windows: `[QCAD installation folder]\plugins`
- Linux: `[QCAD installation directory]/plugins` - I have mine in `~/opt/qcad-3…/plugins`

---

3. Shapes, entities & mods

- **4** shapes

  1. Rectangle
  2. Line tool
  3. Circles for trees
  4. [NURBS](#) for curves! I use `Spline (Control Points)`

- **3** entities

  1. **Block** - a symbol that can be re-used & edited just once
     - Useful for creating shape, **then** applying angle
     - Also, where there are many instances of an element
  2. **Polyline** - a *connected* line, can calculate area. Use command `Draw > Polyline > Polyline from Selection` , shortcut `OC`
     - Useful for grouping lines together
     - Also gives you **area** (can also use measurement tools)
  3. **Text**

- **4** modifications

  1. Offset
  2. Mirror
  3. Divide
  4. Rotate

- Download files from https://github.com/growdigital/cad-gardeners

- See [Survey Class](#) on how to measure up & survey your site.

3.1 Finding your way

- Zoom in/out
  - Mouse scroll
  - `+` & `-` keys
  - `View > Zoom > Auto Zoom`
- Panning
  - Mouse scroll **click**
  - `View > Zoom > Pan Zoom`
- Hit `Escape` to return to arrow tool
- `View > Zoom > Auto Zoom`

3.2 Snap

1. Snap Auto `SA` - automatically snaps to grid or another point
2. Snap Free `SF` - no snapping
3. Snap on Entity `ST` - snaps on to a line or shape
4. Snap to End `SE` - snaps to the end of a line

3.3 Layers

- Organise different elements
- Shape takes layer colour
- My template

3.4 Pre-made blocks

- Forest garden plants
- Native wild plants
- Garden furniture

---

4. Satellite photo

Including a scaled satellite photo in your CAD drawing

1. Take screenshot, including scale
2. Save image to same folder as CAD file

3. Calculate metres per pixel (image scale factor) in image editing software
4. Import image into CAD file
5. Resize image using the image scale factor

4.1 Calculate image scale factor
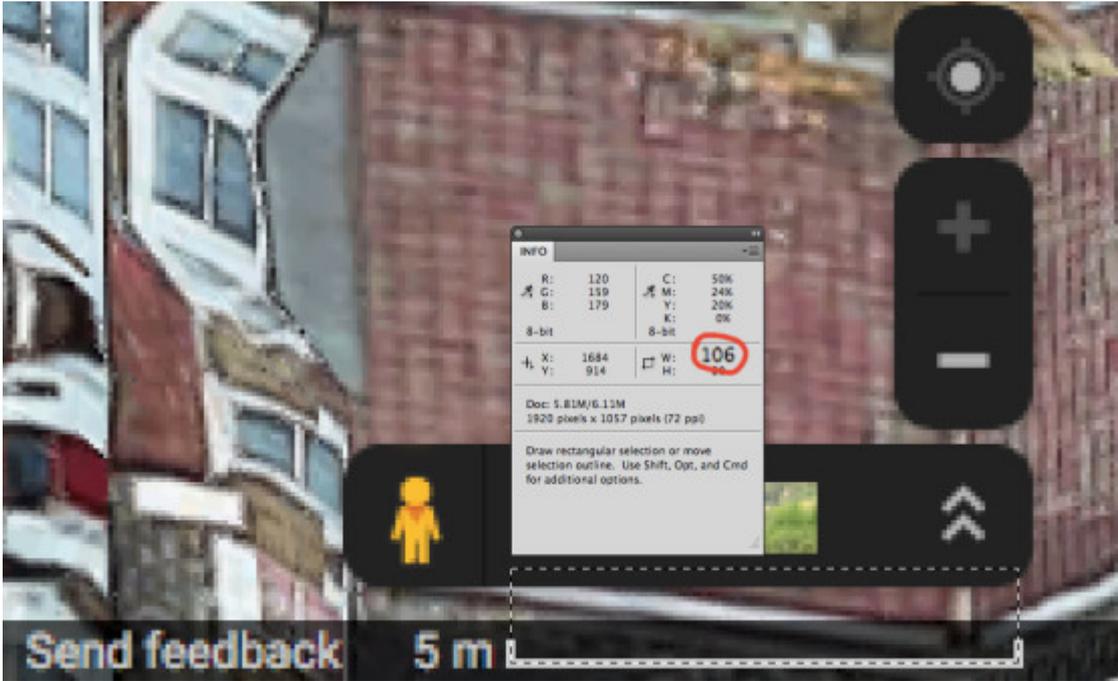
1. Measure pixel length of metres scale
2. **Metres per pixel** `5m ÷ 106px = 0.047169811`
3. Image scale factor = metres per pixel

4.2 Resize image in CAD
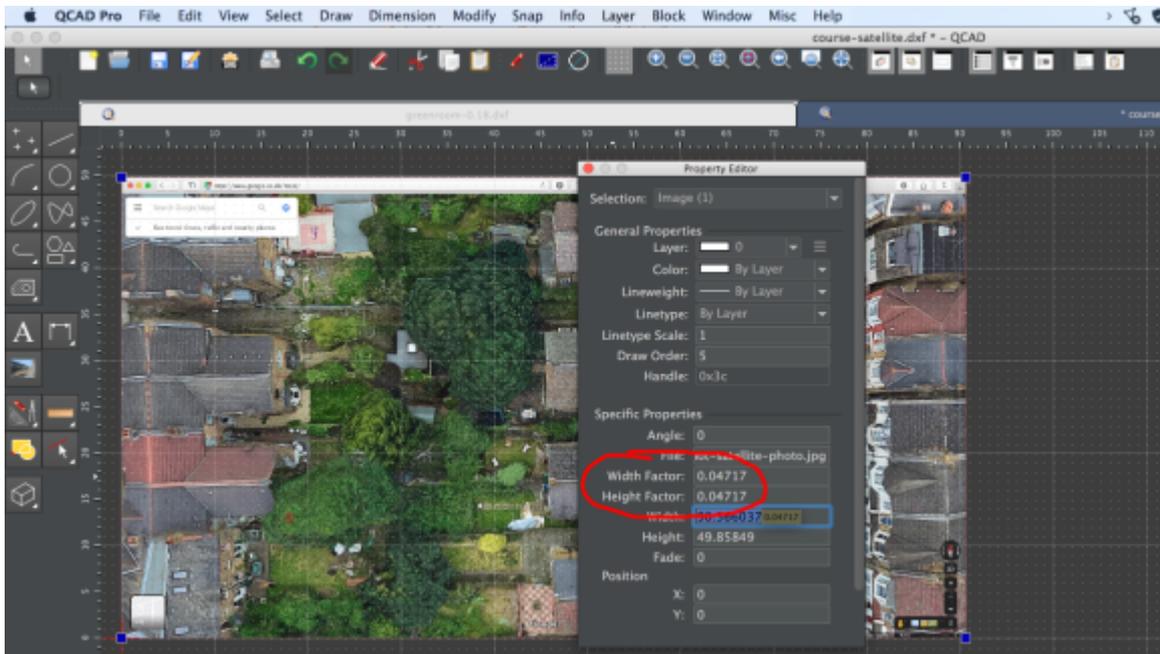
1. `File → Import` , `Select → Select All`
2. `View → Property Editor`
3. `Width & Height Factor:` *image scale factor*

---

5. Class resources

1. Download free version of QCAD
2. CAD files for class
3. Garden Wild Edible public Telegram group
4. QCAD forums
5. CAD Template file
6. Plant spreadsheet template
7. Native plant spreadsheet
8. Forest garden spreadsheet
9. CAD blocks
   - Forest garden plants
   - Native wild plants
   - Garden furniture